CONCLUSIONS Despite the anatomic proximity of the aortic annulus to the LM coronary artery, TAVR plus LM PCI is safe and technically feasible, with short- and intermediate-term clinical outcomes comparable to patients undergoing TAVR alone. Our results suggest that TAVR plus LM PCI is a reasonable option for patients who are at high risk for surgery.

CATEGORIES STRUCTURAL: Valvular Disease: Aortic

KEYWORDS Left main coronary artery disease, TAVI, PCI, Aortic stenosis, CAD, TAVR

TCT-653

Transcatheter Heart Valve Underexpansion Patterns

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BACKGROUND The size of the transcatheter heart valves (THV) is overestimated up to 20% based on aortic annulus diameter measured using computed tomography (CT). However, the prosthesis may not be fully expanded during implantation. THV underexpansion might have detrimental clinical consequences. The aim of this study was to define the degree of underexpansion degree of different THVs, introduced as the shrinking index, and its predicting role in pacemaker implantation after transcatheter aortic valve implantation (TAVI).

METHODS We enrolled 112 patients (68 men, 79±8 years old) who underwent TAVI with the self-expanding CoreValve (n=28), mechanically expanded Lotus valve (n= 35) or balloon expandable Edwards SAPIEN XT (n=18) and Edwards SAPIEN 3 (n= 31). The cover index of the THV was calculated as the percentage difference of the nominal prosthesis size and annulus diameter measured using CT. Intraprocedural transesophageal echocardiography (TEE) was performed to determine the size of the THV inflow after implantation. The shrinking index was calculated as the percentage of the difference between the inflow size by TEE and the nominal prosthesis size divided by prosthesis size. After excluding the patients with baseline pacemaker (n=7) and patients deceased within 24 hours after TAVI (n=4), the role of the shrinking index for pacemaker implantation within 30 days was investigated.

RESULTS Cover index per CT assessment was 18±7% for CoreValve, 2±4% for Lotus, 9±5% for Edwards SAPIEN and 4±5% for Edwards SAPIEN 3 (ANOVA $p<0.001$, Corevalve was significantly larger than the others). Compared with aortic annulus diameter measured using TEE in long axis view, the overestimation increased to 28±9% for CoreValve, 12±8% for Lotus, 18±12% for Edwards SAPIEN and 12±8% for Edwards SAPIEN 3 (ANOVA $p<0.001$, Corevalve was significantly larger than the others). Conversely, the shrinking index after TAVI was -30±6% for CoreValve, -20±5% for Lotus, -22±6% for SAPIEN XT and -19±5% for SAPIEN 3 (ANOVA $p<0.001$, Corevalve was significantly larger than the others). The interobserver variability (relative difference) of TEE in measuring the aortic annulus and prosthesis inflow was 6±5% and 7±5% respectively. Using a cut-off value of -22% of the shrinking index, the pacemaker implantation rate was of borderline difference between patients with shrinking index lower than -22% (pacemaker implantation rate 65%) and those higher than -22% (35%) (univariate analysis $p=0.06$). However, there was no significant difference within each type of THV.

CONCLUSIONS The shrinking index determines the degree of THV underexpansion after TAVI and can be reliably measured with TEE. The self-expanding CoreValve tended to be under-expanded the most, indicated by the largest shrinking index. THV with a shrinking index larger than 22% tended to predict higher pacemaker implantation rate after TAVI. Its definite predicting role needs further study with larger patient population and more covariables included.

CATEGORIES STRUCTURAL: Valvular Disease: Aortic

KEYWORDS TAVI, TEE

TCT-654

Balloon vs Computed Tomography Sizing of the Aortic Annulus for Transcatheter Aortic Valve Replacement

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BACKGROUND Mutidetector cardiac computed tomography (MDCT) is the gold standard for aortic annular sizing in transcatheter aortic valve replacement (TAVR). Balloon sizing is increasingly used in patients when there remains a discrepancy in preoperative assessment for the most appropriate valve size that should be utilized. A comparison between balloon and MDCT sizing has not been reported.

METHODS We retrospectively reviewed 205 patients undergoing balloon-expandable TAVR who underwent preoperative annular MDCT or intraoperative balloon sizing. Baseline characteristics and 30-day outcomes are compared between groups. Logistic regression modules were used to compare paravalvular leak (PVL) rates adjusting for access site (TF or non-TF), valve type (SAPIEN or SAPIEN XT), size (23, 26, or 29), and valve calcification.

RESULTS 205 patients underwent TAVR with MDCT (n=110) or balloon sizing (n=95). Balloon sized patients were older (83 vs. 81 years, $p=0.03$), with more valve calcification (60.2% vs. 30.9%, $p<0.001$), and underwent more minimalist TAVR (61.1% vs. 40%, $p=0.03$). Balloon-sized patients also received less 29 mm valves (9.5% vs. 29.1%, $p=0.001$) and more intraprocedural balloon valvuloplasties (2 vs. 1, $p=0.001$), fluoroscopy time (25.6 vs. 20.3 min, $p=0.001$), and intra-procedural contrast (130.0 vs. 108 mL, $p=0.01$). Though we found no difference between balloon and MDCT sizing in rates of acute renal failure, annular rupture, and $\geq$ mild PVL by angiography or 30-day TTE; balloon sized patients had a higher aortic regurgitation index (Table 1). 30-day rates of $\geq$ moderate PVL were 7.0% with balloon and 5.7% with MDCT sizing ($p=0.34$). Balloon sizing recommended a different valve size in 34% patients that underwent both sizing methods (n=50).